2. Legal Maritime Trade and Activities

Whether transporting dry cargo, petroleum products, or people, ships will continue to provide a cost-effective mode of transportation well into the next century. The vast majority of all commodities moving by sea throughout the world will continue to consist of legal goods in lawful transit. Large container ships and high-speed ferries likely will have the most significant impact on maritime transportation in the foreseeable future. These developments along with several others will continue to pose maritime safety challenges for the United States. The challenges likely will intensify as seaborne trade triples by 2020.[59]

Significant trade growth is expected between the United States and Asia over the next 20 years. "The Clinton Administration predicts that nearly 75 percent of the world trade expansion over the next two decades will come from emerging economies… The economies to watch are China, Taiwan, Hong Kong, South Korea, Brunei, Malaysia, Thailand, the Philippines, Indonesia, and India."[60] Brazil, India, and the Soviet successor states also will increase trade with the United States but not at the same level as Asia.[61] Increased trade with these countries does not necessarily mean more ships, but rather larger ships carrying more cargo. Increased foreign trade also raises the potential for increases in smuggling of illegal goods hidden amongst legitimate cargo.[62]

a. Container Shipping

Figure III-11. The Regina Maersk was the largest container ship to call at a North American port when it sailed into New York Harbor in July 1998.

The container shipping industry will undergo enormous growth through 2020, highlighted by larger ships carrying more cargo. Container ships are already growing in size, with the newest versions too large to enter most U.S. ports. These large container ships, sometimes referred to as mega-ships or super ships, are usually 4,500 TEU[63] or larger and require 43-47 feet of water. Industry experts believe about one-third of the world's container ship fleet will be 4,500 TEU capacity and larger within 15 years.[64] The REGINA MAERSK, 1,043 feet long with a 6,000-TEU cargo capacity and 47.5-foot draft, is just one example of the mega-ships

[59] Charles Bookman, "U.S. Seaports: At the Crossroads of the Global Economy," Issues in Science and Technology (Fall 1996): 71 and U.S. Coast Guard, Coast Guard 2020 (Washington, D.C.: U.S. Coast Guard, 1998), 4.
[60] Richard D. Kohout and others, Looking Out to 2020: Trends Relevant to the Coast Guard (Washington, D.C.: Center for Naval Analyses, 1997), 101.
[61] ibid., 102.
[62] Refer to Chapter III, Section A3 for details on illegal trade.
[63] TEU or 20-foot-equivalent unit refers to the cargo capacity of the ship. A typical 40-foot container is equal to two TEUs.
[64] Moody's Inverstors Service, Moody's Port Ratings: Outlook, (New York, NY, June 1998), 5.

that will transit U.S. waters in the future. The push toward larger container ships is being driven by profit considerations; simply, more containers aboard a vessel decreases the cost per container. Mega-ships primarily will visit a few major load centers, which can handle the ship size and cargo volume. As a result, feeder ships transiting from the load centers to smaller ports will increase coastal trade.[65] An increase in coastal trade could mean more U.S.-flagged ships.

With the move toward huge container ships calling on a few major load centers, another possible development in the container industry will be the "Fast Ship" working between the load centers and feeder ports. In the "Fast Ship" scenario, smaller, 1200-TEU container ships traveling at speeds of up to 40 knots rapidly move containers to the feeder ports.[66] The movement of these relatively large vessels at such high speeds could create safety concerns in the coastal shipping lanes.

b. Bulk and Break-bulk Cargo

While the growth in containerized cargo will have the greatest impact on future U.S. shipping trends, bulk and break-bulk cargo will remain extremely important through 2020. Bulk cargo vessels carry large quantities of cargo, such as grain or iron ore, in large, uncompartmented cargo holds. Break-bulk cargo vessels carry their shipments in barrels, bags, pallets, or other units. Bulk and break-bulk cargoes make up half of all cargo (by volume) entering or leaving the United States,[67] and will continue to account for a large portion in 2020. Cargo freight rates for these vessels that operate in the Atlantic have remained relatively stable as demand for shipments between the United States and Europe has fluctuated. In the Pacific market, Asian economic difficulties and currency devaluations have greatly reduced the demand for cargo shipments from the United States to Asia, but the demand for shipments from Asia to the United States has actually increased. Generally, when one market slows down, excess vessels can be moved quickly into other markets. Thus the outlook for bulk and break-bulk cargo vessels should be stable for the foreseeable future.[68] Bulk and break-bulk cargo will remain critically important in U.S. maritime trade, but because no major changes in this field are expected, the demands on port infrastructure, vessel safety, and law enforcement efforts, from this sector of the market, will remain relatively stable.

---

[65] Refer to Chapter III, Section A2e for information on port infrastructure.

[66] United States Coast Guard, Commandant (G-MRP-1), Business Plan for Marine Safety and Environmental Protection (Washington, D.C.: U.S. Coast Guard, 1997), 11, citing DRI/McGraw Hill, World Sea Trade Service and World Fleet Forecast Service 1996, and DRI/Mercer Management, World Sea Trade Outlook Conference, October 1996.

[67] Interview with Scott Poyer, Chief Economist at St. Lawrence Seaway Development Corporation, interview with author, 13 Jan 99.

[68] ibid.

[69] U.S. Department of Energy, Energy Information Administration, Annual Energy Outlook 1998: With Projections to 2020 (Washington, D.C.: U.S. Department of Energy, December 1997), 6.

c. Tankers

Tanker traffic in U.S. waters will increase substantially by 2020 as U.S. oil imports rise. Increasing energy demand in the United States and decreasing domestic petroleum production will drive oil imports from 46 percent of U.S. petroleum consumption in 1996 to 66 percent in 2020.[69] The demand for increased oil imports will be met with more transits rather than growth in tanker size.[70] Domestically, Alaskan oil production will decrease, while oil drilling in the Gulf of Mexico will move farther offshore. These trends will bring accompanying changes in tanker movement patterns. By 2020, more foreign tankers will be entering U.S. waters, especially the Gulf of Mexico. The Gulf will be the area of primary activity for two reasons. First, most of the U.S. oil refining capacity is in Gulf ports. Second, increased deepwater oil production in the Gulf likely will require tankers as well as pipelines to move oil ashore. On the West Coast, fewer U.S. tankers will be transiting from Alaska to refineries in Southern California, because of the drop in Alaskan oil production. However, there will be more foreign tankers bringing oil to West Coast refineries.

Liquefied natural gas (LNG) imports into the United States will continue through 2020, but not at significant levels. Although LNG shipments will only represent a small portion of U.S. energy imports, the volatile characteristics associated with LNG will present a significant safety concern during vessel transits. Two U.S. ports (Everett, Massachusetts and Lake Charles, Louisiana) likely will continue to import LNG through 2020.[71] LNG imports into Everett and Lake Charles are projected to increase, reaching a level of 0.36 trillion cubic feet in 2020, compared with 0.04 trillion cubic feet in 1996.[72]

Figure III-12. Nuclear waste being loaded for shipment.

d. Nuclear Waste

The need to move and secure shipments of spent nuclear fuel and waste from reprocessing will increase. This trade is now predominately between the Far East and reprocessing facilities in Europe. Future concerns about an environmental catastrophe and security of the nuclear waste will lead to increased demands for storage in or transit through U.S. hands, particularly from the Russian Far East.[73] At the same time, increased numbers of plants will generate a growing surplus of spent fuels to be transported.

[70] United States Coast Guard, Commandant (G-MRP-1), Business Plan for Marine Safety and Environmental Protection (Washington, D.C.: U.S. Coast Guard, 1997), 13.
[71] U.S. Department of Energy, Energy Information Administration, Annual Energy Outlook 1998: With Projections to 2020 (Washington, D.C.: U.S. Department of Energy, December 1997), 61.
[72] ibid., 61.
[73] Notes from Charles Dragonette, Office of Naval Intelligence, December 1998.

e. Port Infrastructure

U.S. ports will face intensifying pressure to expand to meet the growing volume of shipping and to combat the threat of foreign competition. The container industry, in particular, because of the increasing volume of cargo and the growing size of the ships themselves, will divide ports into two categories: load centers and feeder ports. "The relentless introduction of large containerships into U.S. trades is dividing the port industry into two camps: an elite tier of large ports with deep harbors and excellent inland infrastructure, and a second tier of feeder ports that cannot accommodate the new generation of vessels."[74]

The ports that are able to expand and meet market demand will progress into load centers for the United States. Several factors, including harbor depth, efficiency in intermodal connections, labor productivity, and the size of the local market will influence a port's ability to develop as a load center.[75]

Figure III-13. Containerships will drive port development over the next 20 years.

⇑ Harbor depth. In order to be a successful load center, a port's waters likely will have to be at least 45 feet deep.[76] Mega-ships such as the REGINA MAERSK will require deep channels to access port facilities in order to offload their enormous amount of container cargo.[77] Ports that cannot dredge because of legal and environmental restrictions will be forced into the feeder port category.

⇑ Intermodal efficiency. Load centers will require efficient terminals and inland infrastructure in order to move large volumes of cargo. Load centers will require superb railways, roadways, and inland waterways, and will need efficient, rapid means for moving high volumes of cargo from the dock to the secondary mode of transportation.

[74] Bill Mongelluzzo, "How Big Ships Will Change Port System: Some Facilities Face Inevitable Demotion To Feeder Status," Journal of Commerce, 29 September 1997, accessed on OSIS computer system.
[75] Moody's Investors Service, Moody's Port Ratings: Outlook, (New York, NY, June 1998), 5.
[76] ibid., 6.
[77] Refer to Chapter III, Section A2 for more details on mega ship transits.

⇑ Labor productivity. Ports will attract more customers if they can service ships quickly and thereby reduce the associated labor costs. The reliability and productivity of the labor force in a port will influence how favorably a port is viewed by the shipping industry.

⇑ Local market. Large local markets stimulate intermodal connections, provide relatively fixed revenues, and reduce competition from other ports because of the proximity of the market to the port.[78]

Load centers will play an important maritime role as both mega-ships carrying large volumes of cargo and feeder ships conducting coastal trade travel the harbor waterways. Under pressure to develop into load centers, several ports are undertaking significant projects in order to meet future shipping needs. The success of these developments will become important in determining which ports evolve into load centers.

Figure III-14. The port of Long Beach is currently one of the busiest cargo container ports in the United States.

The ports that do not evolve into load centers will become feeder ports. Feeder ports still will play an important role in maritime trade, even though they will not handle volumes of cargo nearly as large as those moved through the load centers.[79] Unlike the load centers, feeder ports will be less affected by global developments in the shipping industry. These ports will strive to diversify into bulk and break-bulk trades to avoid dependence on the container industry. However, lower profit margins in bulk and break-bulk, and competition from other transportation modes (railroads, pipelines and canals/waterways), may prevent ship owners and operators from driving expensive capital development the way they can in the containerized sector.

While U.S. ports will compete among themselves for positions as load centers, their greatest competition may very well come from foreign ports. Vancouver, Halifax, and Freeport (Bahamas) already compete with American ports for U.S.-bound container cargo, and by 2020 Mexican ports could challenge as well, if improvements planned for the Mexican transportation infrastructure are completed. Halifax, where the main channel is 60 feet deep, has captured ten

[78] Moody's Inverstors Service, Moody's Port Ratings: Outlook, (New York, NY, June 1998), 6.
[79] Terry Brennan, "Eastern Ports' Fate Hangs On Dredging: Deep Channels Needed For Big Vessels," Journal of Commerce, 22 June 1998, accessed on OSIS computer system.

percent of New York's Midwest-bound traffic annually over the last four years.[80] The deep harbor and intermodal infrastructure in Halifax make the port a strong competitor for eastern U.S. ports. The North American Free Trade Agreement further enhanced the competitiveness of Halifax and other non-U.S. North American ports, expanding their access to U.S. markets. While 98 percent by weight of all cargo leaving or entering the United States currently passes through U.S. ports,[81] the challenge from foreign ports, particularly in containerized cargo, could reduce that figure.

f. Cruise Ships and Ferries

Tremendous growth in the cruise line industry and the emergence of high-speed ferries will be the key developments in the maritime passenger transport business through 2020. Both developments will pose challenges to maritime transportation in the United States.

Figure III-15. Royal Caribbean's cruise ship, Voyager of the Seas, is under construction in Finland. The vessel will displace 142,000 - tons and span the length of three football fields.

The cruise line industry will exhibit strong growth throughout the next two decades. The average annual growth of the industry has been almost eight percent since 1980, and with the world fleet of 230 cruise ships operating at 90 percent capacity,[82] there are no signs of this growth slowing. North America is the largest market, and surveys indicate that 56 percent of Americans want to take cruises, while only 11 percent have done so. The number of cruise line passengers worldwide is projected to triple to 15 million by 2020, according to one industry expert.[83]

[80] Moody's Inverstors Service, Moody's Port Ratings: Outlook (New York, NY, June 1998), 12.
[81] National Oceanic and Atmospheric Administration, "Promote Safe Navigation," 10 July 1998, accessed online, URL:<http://anchor.ncd.noaa.gov/psn/psn.htm>.
[82] Don Walsh, "Oceans," Proceedings Vol. 125/2/1,152 (1999): 89.
[83] Notes from Andy Vladimir, author of Selling the Seas: An Inside Look at the Cruise Industry, 3 August 1998.

The cruise line industry will respond to this increasing demand with new ships and new markets. The number of cruise ships will likely double before 2020; the industry already is building or has plans to build 44 ships. Many of these new ships will be larger as well, with behemoths such as the 142,000-ton VOYAGER OF THE SEAS coming on line within the next two years.[84] The president of Carnival Cruise Lines believes the overriding trend in the worldwide cruise industry will be the significant increase in global capacity as older ships are retired from the North American arena.[85] New cruise markets will emerge as these older vessels reposition to other areas. The Caribbean will remain the top destination of cruise ships, with approximately 60 percent of such traffic,[86] but more routes will open to remote areas such as South Pacific islands, the Amazon, and Antarctica.

The particular factors involving U.S. policy could have a profound impact on the cruise industry in the next 20 years. First, Cuba will become a very popular destination if the U.S. embargo is lifted. A 1992 study found that half a million cruise passengers would likely visit Cuba in the first two years after the lifting of the embargo, followed by 1.2 million in the subsequent few years.[87] Second, if the Passenger Service Act—which requires U.S. crew members on cruise ships transiting from one U.S. port to another U.S. port—is amended, there could be more cruises to destinations like Hawaii since cruise lines will be able to increase profits by hiring foreign laborers at lower wages.

Another maritime transportation industry expected to grow significantly by 2020 is the high-speed ferry business. In certain world markets, high-speed ferries are already competitive with other forms of transportation, particularly commuter airlines. High-speed passenger ferries already have begun to ply U.S. waters and will increase in number and speed over the next two decades.

Figure III-16. The Bay Ferries' Cat can reach speeds in excess of 50 knots making it the fastest car ferry in North America.

[84] Don Walsh, "Oceans," Proceedings Vol. 125/2/1,152 (1999): 89. The *Voyager of the Seas* will out-displace a fully loaded *Nimitz* class aircraft carrier by almost 50,000 tons.
[85] "Leaders' Roundtable: The Next Millennium," Cruise Industry News Quarterly Vol.7 No.28 (1997).
[86] Notes from Andy Vladimir, author of Selling the Seas: An Inside Look at the Cruise Industry, 3 August 1998.
[87] Joan Sanchez, "Trends at US Cruise Ports," World Cruise Industry Review (1996): 136.

SeaConn is one emerging high-speed ferry company and is illustrative of the future high-speed ferry industry. SeaConn is creating a super high-speed passenger ferry system that connects Long Island, Connecticut, and New York City. These ferries will be the fastest in the world, significantly reducing the commute to and from New York and between Long Island and Connecticut. The SeaConn system will operate seven vessels, each 214 feet long and capable of speeds in excess of 60 knots. [88]

Ferries, such as those employed in the SeaConn system, will pose significant safety challenges as they encounter other maritime traffic. The potential for mishaps will grow as technology increases ferry speeds. Some experts are predicting high-speed ferries could reach speeds up to 80 or even 100 knots as they strive to compete with other forms of transportation.[89] The challenge will be to maintain adequate separation between these high-speed ferries and other vessels, thereby reducing the risk of human error.[90]

g. Underwater Cables

The undersea cable industry is expected to grow considerably through 2020 as the fiber-optic cables industry strives to compete against satellite communications. Growth in undersea cable investments between 1997 and 1998 increased by 81 percent demonstrating a strong resurgence in the undersea cable market.[91] Several companies are involved in building extensive fiber optic networks to support the future cyber world. As a result of these vast cable networks, new infrastructure for cable repair and maintenance will be required for support.

Figure III-17. More cable ships will be required to sustain the growing fiber optic cable industry over the next 20 years.

[88] Doren Voeth, "New York flying boats," International Cruise and Ferry Review (1998): 109.
[89] Nigel Gee, "For higher speeds – the 100 knots ship?" International Cruise and Ferry Review (1998): 122-123.
[90] DNV Corporate Communications, "DNV experience strong growth in the high speed market," 22 October 1996, accessed online.
[91] PRG Guide, "1998 Worldwide Summary of Fiberoptic Undersea Systems," accessed online, URL: <http://www.prgguide.com/reports/fiber/r11-31w.html>.

Two projects under development help paint a picture of what the future will hold. "Project Oxygen is an ambitious initiative to lay 320,000 km of mainly undersea fiber optic cable, with 262 landing points in 175 countries and locations to produce a US $14 billion 'Super-Internet.'"[92] The cable maintenance for Project Oxygen will ultimately be performed by 23 cable ships.[93] Global Crossing Ltd. is building a similar undersea cable network which will directly connect Asia, North America, Europe, Central America, and the Caribbean.[94] As the size and scope of the undersea cable industry expands rapidly, the infrastructure necessary to support cable repair and maintenance will increase accordingly. The recent and projected growth of the cable industry represents a significant resurgence, which could grow considerably during the next twenty years if initial networks prove successful.

3. Illegal Maritime Trade and Activities

A drawback of increasing maritime trade, and economic globalization in general, is that it will facilitate the expansion of transnational crime. Trafficking in drugs, arms, and people is already big business, with maritime means a key method of transport. These transnational crimes will not disappear by 2020, and may, in fact, increase. The corrupting influence of the organized crime groups controlling these activities will threaten the safety of peoples and the security of governments. The ability of these organized crime groups to form alliances and easily permeate international borders in 2020 will intensify their threat to the state.

a. Drugs/Narcotics

Control of the processing and sale of illicit drugs worldwide is a continuous challenge that has no short-term solutions.[95] The United States has wrestled with drug control since the 1930s when the Federal Bureau of Narcotics was first established. Since then, increasingly rigorous anti-drug programs have failed to keep the U.S. population from becoming the world's greatest illicit drug consumer.[96] The U.S. General Accounting Office estimates that law enforcement, corrections, and public health costs of the illegal drug problem total $67 billion annually.[97] Despite U.S. and foreign efforts, to date, no solution to the Gordian knot of drug control has emerged.

---

[92] Peter H. Nelson, "Project OXYGEN," accessed online, URL: <http://circle4.com/allblack/oxygen.html>.
[93] CTR Group Ltd., "Frequently Asked Questions About Project Oxygen," accessed online, URL: <http://www.oxygen.org/project_oxygen_faq.htm>.
[94] Global Crossing Ltd., "Global Crossing," accessed online, URL: <http://www.globalcrossing.bm/city2city.html>.
[95] Office of National Drug Control Policy, The National Drug Strategy, 1998: A Ten Year Plan (Washington, D.C: Office of National Drug Control Policy, 1998), 3.
[96] United Nations Drug Control Programme, World Drug Report (New York, NY: Oxford University, 1997), 328.
[97] Draft, Kim Thachuk, "Transnational Trends: *New Threats?*," Strategic Assessment 1999 (Washington, D.C.: Institute for National Strategic Studies, National Defense University, 1999), 372.

There is little evidence to suggest this complex problem will be solved by 2020. Given that there likely will be a future illicit drug market, there also will be sources of supply and transportation methods to deliver drugs to market; the maritime trafficking of illegal drugs is expected to remain a global threat.

(1) The illicit drug market. Assessing the worldwide future demand for illicit drugs is difficult. While profit is the central motive in the decision to sell illegal drugs, motives for using drugs can vary greatly. Societal and cultural mores provide a starting point from which a nation's children begin making decisions about the seemliness of drug use. Since attitudes formed early tend to stay with one throughout life, teen opinions and attitudes about drug use are an important predictor of what a future market may look like.

In the United States, teen perceptions concerning drug use are mixed, but it is clear there is a teen drug problem. Almost one out of every ten teenagers and one in four twelfth graders use illegal drugs.[98] Although current levels are fairly low, there has recently been a significant increase in teen use of heroin.[99, 100] While most teens view cocaine and heroin use as risky or dangerous, they nevertheless are experimenting with these drugs at an increasingly younger age. Despite current efforts, the total amount of hardcore cocaine users in the United States has remained relatively constant.[101] Hardcore users consume three quarters of the total cocaine consumed in the United States.[102] As for marijuana, teens perceive it as a less dangerous drug.

While these facts do not lend themselves to any specific conclusions concerning the scope of the U.S. drug market in 2020, they do suggest that:

- ⇑ ***By 2020, there will be an illegal drug market comprised of adults who habitually used drugs as teens in the late nineties.*** These adults will have greater access to drugs primarily due to an increase in disposable income from full-time jobs.

- ⇑ ***The number of chronic cocaine users will not significantly change.*** The number of chronic cocaine users has not significantly changed in seven years.

[98] Office of National Drug Control Policy, The National Drug Strategy, 1998: A Ten Year Plan (Washington, D.C.: 1998), 7.
[99] ibid.
[100] The rise in teen heroin use has been linked to the recent increase in availability of high-purity Colombian heroin. This high-purity heroin can be ingested by smoking or snorting, thus eliminating the need to inject the drug and greatly reducing former barriers to use.
[101] Office of National Drug Control Policy, What America's Users Spend on Illegal Drugs (Washington, D.C.: Office of National Drug Control Policy, Fall 1997), 41.
[102] Office of National Drug Control Policy, The National Drug Strategy, 1998: A Ten Year Plan (Washington, D.C.: Office of National Drug Control Policy, 1998), 6.

Given that any program attempting to alter perceptions of drug use will require time to take effect, (reversing perceptions of tobacco use took 20 years) the number of chronic users will not be significantly altered by 2020.

⇑ ***Cocaine market demand will not significantly change***. Given that chronic users account for three-quarters of the total cocaine market, the number of chronic users is unlikely to change significantly by 2020.

⇑ ***The global use of illicit drugs may increase if social mores change significantly.*** Such changes could develop as a result of improved methods of drug ingestion, revived attempts to legalize controlled drugs, greater concern over personal freedoms, the lax enforcement of current drug laws, or a general global acceptance of drug abuse as an uncontrollable issue.

While the popularity of certain drugs waxes and wanes, the United States, in general, has a large appetite for illegal substances. This appetite sometimes manifests itself in attempts to legalize certain drugs, especially drugs not considered "dangerous." Therefore, attempts to legalize marijuana have occurred regularly during the last twenty years, but there has been little effort to legalize other controlled drugs such as cocaine and heroin. Public perceptions of these drugs as "dangerous" will likely keep them confined to the U.S. Controlled Substances Schedule. In the unlikely event that marijuana is eventually legalized, enforcement officers will still need to be vigilant against traffickers importing other dangerous drugs.

Figure III-18. New drug producing countries will emerge in 2020.

(2) Illicit drug sources. Worldwide illegal drug production is expected to continue to expand well into 2020. Illegal drug producers will be increasingly flexible in circumventing international enforcement efforts. They will be able to weather law enforcement attacks on specific drug production nodes and survive. This flexibility will be largely due to an increased use of technology to support highly mobile operations and to improve both operational security and production methods. Organized crime syndicates will provide effective business planning and will make use of their significant financial power to corrupt the authorities in a growing number of countries. The financial power of the cocaine industry in Latin America, for example, is staggering; cocaine is Latin America's

second largest export, accounting for 8 percent of the GDP of Colombia, and 3-4 percent of that of Peru and Bolivia.[103]

It is not surprising that during the past decade, illicit drug production has spread to places where law enforcement poses the least threat.[104] By 2020 major drug producing nations such as Afghanistan (heroin), Colombia (cocaine, heroin), and Mexico (marijuana, heroin and synthetic drugs), will likely be competing with other countries to supply major U.S. and European markets. Countries most vulnerable to being overwhelmed by drug producers are those that have weak central governments, access to regional or global drug markets, and remote areas where illegal drugs can be cultivated without detection. These conditions exist in many Eurasian countries of the former Soviet-bloc,[105, 106] as well as some developing African nations.[107] With the drug trade's significant profit potential, several of these countries will likely fall into the ranks of those where drug production is already endemic. [108]

Figure III-19. Technology will improve drug production capabilities in 2020.

Future producers will use technology at least as efficiently as today's narco-businessman. Tools such as portable computers, handheld satellite phones, and increasingly "miniaturized" equipment make highly mobile production facilities an easily attainable goal. Where mobility is not required, producers can use technology to reduce operating expenses. Large-scale cannabis growers use computer-controlled, warehouse-sized hydroponics hot houses to grow thousands of plants in optimum growth conditions.[109] With computers controlling water, plant food, light, and heat, fewer people are required, decreasing labor costs and improving operational security. Other improvements in the technical process have increased plant yields in both coca leaves and marijuana. In Colombia, chemical process improvements have yielded higher purity heroin than that of rival producers in Mexico. In the future, technology may allow producers to further increase plant yields, cheaply produce synthetic versions of organic drug components, or even mask indicators of drug use.

---

[103] Draft, Kim Thachuk, "Transnational Trends: New Threats?," Strategic Assessment 1999 (Washington, D.C.: Institute for National Strategic Studies, National Defense University, 1999), 372.
[104] United Nations Drug Control Programme, World Drug Report, New York, NY: Oxford Press, 1997), 9.
[105] Dr. Stephen E. Flynn, Beyond Sovereignty, Unpublished book manuscript (New London, CT: U.S. Coast Guard Academy, October 1998), 7.
[106] These countries include Kazakstan, Kyrgystan, Uzbekestan, Turkmenistan, Tadjikstan, Ukraine, Azerbaijan, and Georgia.
[107] These countries include Kenya and Nigeria.
[108] Countries of Southeast and Southwest Asia and Colombia for heroin; Peru, Bolivia, and Colombia for cocaine; Colombia, Mexico, Jamaica, Canada, and the U.S. for marijuana, the U.S. and Mexico for methamphetamines and other synthetic drugs.
[109] National Drug Intelligence Center, The National Drug Intelligence Digest Special Report, Marijuana: Domestic Situation Report (Johnstown, VA: National Drug Intelligence Center, March 1998), 9.

While technology may significantly improve raw production capabilities, organized crime will provide many producers the business acumen, political leverage, and funds with which to effectively expand their enterprise. High-profit potential will continue to attract crime syndicates to the drug production business in 2020.[110] For producers, the diversification these partners bring could provide ready-made distribution networks, money laundering services, and even venture capital, which could be used to purchase and incorporate new technology. This union of complimentary criminal enterprises inextricably links the drug trade to a host of other crimes such as smuggling (drugs, weapons, people) gambling, prostitution, and corruption.[111, 112]

Figure III-20. More than 6 tons of cocaine were seized from the motor vessel Limerick in October 1997.

(3) Illicit drug movement. Drug trafficking will continue to plague the global community well into 2020. Future traffickers will increasingly rely on commercial transportation systems to move their products.[113] The relatively low cost of maritime bulk transshipment and good product security, as well as limited personal risk, will entice a number of future drug transporters away from traditional non-commercial maritime methods. Smugglers moving smaller loads by speedboat will have more capable platforms than vessels currently in use, and future amateur smugglers will be able to effectively use traditional smuggling techniques with some degree of success.

Commercial maritime trade overall is expected to triple by 2020. A global trend in trade deregulation is largely responsible for this jump in international cargo movement. With the soaring of container shipping, regional transportation systems are increasingly becoming intermodal.[114] International trading blocs are connecting their container moving systems (road, rail, and sea) together to allow for easy cargo passage through international boundaries. In addition to offering future drug transporters simplicity and convenience for shipping their product, the sheer volume of cargo being shipped via this method ensures no one specific shipment will be scrutinized too carefully. This method is certainly the most cost effective.

---

[110] United Nations Drug Control Programme, World Drug Report (New York, NY: Oxford Press, 1997), 133.
[111] United Nations Drug Control Programme, World Drug Report (New York, NY: Oxford Press, 1997), 329.
[112] Michael Klare and David Andersen, A Scourge of Guns: The Diffusion of Small Arms and Light Weapons in Latin America (Washington, D.C.: Federation of American Scientists/Arms Sales Monitoring Project, 1996), 4.
[113] See Chapter III, Section A2a – Legal Maritime Trade and Activities – Container Cargo.
[114] Ken Cottrill, "Intermodal Shipping Special Report: Bypassing Intermodal", Traffic World (14 September 1998): 35.

For smugglers moving smaller loads, traditional speedboats or "go-fasts"[115] will likely continue to improve beyond today's impressive standards. Current fast boats used for smuggling can carry a metric ton of drugs at speeds of 35 knots or more and are very difficult to detect.[116] Future boats may triple the speed and cargo capacity of current platforms, while virtually "disappearing" from law enforcement sensors through the use of a variety of low-observable technologies. Innovations such as super efficient engines or jet drives may significantly increase their operating range, and new computers may allow for the remote operation of high-speed delivery vehicles from an airplane or remote site.

Figure III-21. The capabilities of speedboats will likely improve the ability to transport drugs in 2020.

Notwithstanding future technological improvements in drug detection, the resolve of anti-drug forces and the varying levels of political will to combat drug trafficking, future smugglers likely will be able to engage in their trade using methods and equipment common today. Despite current law enforcement's growing capability to counter smuggling, traffickers continue to reap enviable profits even with 25-30 percent load losses. This "cost" of doing business is one example of the typical smuggler's flexibility using conventional methods. Traffickers will continue to exploit gaps in law enforcement capability as well as legal and political impediments to international enforcement efforts.

(4) International resolve. Absent a dynamic change in international cooperation and domestic resolve to substantially reduce illegal drug availability, the impediments to tomorrow's counterdrug forces will continue to be political, jurisdictional, and sovereignty issues which blunt effective drug control.

Effective regional drug control plans hinge on international cooperation, and future plans will require extensive collaboration among regional partners. International commitment and governmental resolve will be critical to any plan which might require the softening of sovereignty claims, cooperation with historically hostile states, and the commitment of resources such as defense forces and national police.

[115] Smugglers use "go-fasts" to directly deliver drugs from a source country to a customer in the arrival zone, as a high-speed ferry after receiving drugs from a mothership, or as the primary recipient of drugs dropped from aircraft.

[116] This description of go-fast characteristics is taken from U.S. Coast Guard post-event reporting of go-fast smuggling incidents from 1991-1998. This figure represents the average capabilities of vessels operating in the Caribbean and Eastern Pacific; individual characteristics vary widely.

This level of resolve, while difficult to achieve, will be necessary if the world's nations are to deny illegal drug producers' and traffickers' exploitable niches. These niches extend beyond sovereignty concerns and constitutional interpretations, and are more complex than simply stopping drug boats. Drug producers rely on a business infrastructure to support their trade. Future enforcement efforts will need to exert greater pressure on key business nodes such as:

- ⇑ Crop production
- ⇑ Facility Security (insurgents, guerillas, and militias)
- ⇑ Communications and Operational Security
- ⇑ Transportation
- ⇑ Chemical reagents for processing
- ⇑ Cash Flow (money laundering/cash transportation).

The removal of any piece of this critical infrastructure would cause a significant disruption in the production or transportation of illegal drugs.

The simple removal of a drug production business node seems like an easy solution, but disruption even in one country is a difficult task. Even if this goal is achieved, the current global demand for illegal drugs is so massive that producers will remain intent on overcoming production obstacles with new methods or by moving production to another exploitable country. Although future drug control programs will need to develop and then emphasize demand reduction strategies, the interdiction of drugs at sea will remain a major tenet in reducing the available drug supply.

b. Arms Proliferation

Weapons will continue to be in high demand in 2020 throughout the world. Violence and open conflict resulting from ethnic or religious differences, nationalism, class struggle, criminal activity, or competition for resources will be constant threats, and may destabilize individual countries or entire regions. The various groups involved in these conflicts will often desire arms to help obtain their goals by force, if necessary, ensuring a thriving illicit arms trafficking business in 2020.

A large part of the illicit arms market will consist of small arms and light weapons ranging from handguns to shoulder-fired surface-to-air missiles. Such weapons are easier to conceal and therefore easier to smuggle, and forces and groups armed with such weapons can cause damage and casualties disproportionate to their numbers. In some cases, irregulars can use such weapons to avoid defeat by — or even achieve victory against — the most modern and powerful military forces. In the recent past, for example, the Chechens fought the Russian Army to a standstill, and Somali clans weath-

ered an intervention by modern Western forces. Bosnia-Herzegovina, Chechnya, the Mexican state of Chiapas, Colombia, Kosovo, Liberia, Rwanda, Somalia, and Zaire/Congo are just a few of the places where conflicts involving irregular forces fielded by insurgents or tribal groups and armed primarily with light weapons have captured media attention since the early 1990s.[117]

According to the Federation of American Scientists, "there are more than thirty wars raging in countries around the world today. These wars are being fought primarily with light weapons and small arms…Few combatants involved produce any, let alone the bulk of these munitions. Most light arms being used in these conflicts are imported – either through legal international channels, or through the black market."[118]

The demonstrated need for and effectiveness of small arms and light weapons will fuel a continued black market through and beyond 2020. Trafficked weapons will include both newly manufactured ones and older weapons drawn from arms caches maintained by stateless organizations or sold and transferred from the inventories of states. A portion of the arms traded on the black market inevitably will move by sea. In the United States, the greatest maritime challenge with respect to small arms and light weapons is and will remain their illegal exportation; overseas, the illicit arms market will operate worldwide.

Figure III-22. Small arms support criminals, terrorists, insurgents, and other groups.

(1) The market for small arms/light weapons. The low cost of small arms and light weapons in comparison to heavy weaponry increasingly will attract new buyers.

In South America, for example, the Revolutionary Armed Forces of Colombia (Spanish language abbreviation FARC) and the National Liberation Army (Spanish language abbreviation ELN) have been engaged in a bloody conflict with the Colombian government for decades. In Colombia, paramilitary and insurgent forces use small arms and light weapons to conduct political assassinations and intimidation. "Violence is that country's leading cause of death. With a record 25,100 violent deaths in 1992, Colombia's murder rate is approximately nine times that of the United States."[119]

In addition to its importance to insurgents, the illicit small arms market is closely linked with drug dealers and other criminal groups and is growing as these elements work

[117] Lora Lumpe, "Illicit Arms Market Sustains Global Conflicts," Journal of the Federation of American Scientists (July/August 1997): accessed online.
[118] Federation of American Scientists, "Monitoring the Diffusion of Light Weapons: A Campaign of the Arms Sales Monitoring Project," accessed online, URL: <http://www.fas.org/asmp/light_weapons/index.html>.
[119] Michael Klare and David Andersen, A Scourge of Guns: The Diffusion of Small Arms and Light Weapons in Latin America (Washington, D.C.: Arms Sales Monitoring Project, Federation of American Scientists), 5.

together to move illicit substances throughout the world. The lucrative business of smuggling small arms and light weapons, often in close connection with drugs, will remain a significant driving force behind small arms smuggling in the years ahead. In some cases, profits from drug trafficking provide the funds that insurgents need to purchase weapons.

In 1998, Russian organized crime groups reportedly exchanged weapons from their vast arsenal for Colombian drugs. Since the Russian crime syndicates can provide sophisticated weapons and new drug markets, alliances between Russian and South and Central American crime groups will remain likely. In Mexico, gun running is the third richest source of profit after drug trafficking and robbery/extortion.[120] The growing number of small arms, which are smuggled to support organized crime and narcotrafficking, will allow drug cartels to resist government crackdowns violently and ultimately enhance their ability to smuggle drugs into the United States.[121]

Figure III-23. VS SS1 Rifles.

(2) Sources of small/light weapons. Both new and old small arms and light weapons will emanate from a variety of sources, including the United States. Arms caches from civil wars and military armories sold on the black market will contribute to the growing diffusion of small arms and light weapons in the years ahead.

Small arms smuggled out of the United States will be among those available on the black market, and stopping that smuggling will a present a significant challenge to U.S. law enforcement agencies. U.S. arms manufacturers produce approximately five to six million weapons each year.[122] Some of these weapons are smuggled into Mexico where an enormous small arms market exists. "Proximity, liberal gun sale laws, and inadequate law enforcement have made the U.S. Mexico's leading source of black market arms — despite Mexico's own strict gun control policy," according to the Federation of American Scientists.[123] Weapons originating from the United States and illegally entering Central America via Mexico have fueled high crime rates in the region. The Inter-American Development Bank estimates that 120,000 people are murdered every year in Latin America, many by criminals, terrorists, and insurgents wielding U.S.- made firearms.[124]

---

[120] Lora Lumpe, "The US Arms Both Sides of Mexico's Drug War," Covert Action Quarterly (Summer 1997): accessed online.

[121] Michael Klare and David Andersen, A Scourge of Guns: The Diffusion of Small Arms and Light Weapons in Latin America (Washington, D.C.: Arms Sales Monitoring Project, Federation of American Scientists), 9.

[122] Lora Lumpe, "The US Arms Both Sides of Mexico's Drug War," Covert Action Quarterly (Summer 1997): accessed online.

[123] ibid.

[124] U.S. Southern Command, "Arms Trafficking in the Caribbean," accessed on Intelink.

In addition to those newly manufactured in the United States and smuggled overseas, small arms and light weapons already in circulation will continue to sustain the black market. Many of the weapons in circulation in the late 1990s date back to Soviet and American arms transfers to Central America in the 1970s and 1980s.[125] In addition, U.S. weaponry abandoned in Vietnam in the early 1970s was smuggled to insurgent movements in Nicaragua, El Salvador, and other Central American states in the early 1980s. The enormous number of small arms that supported the civil wars in Central and South America in the 1980s remain in circulation on the black market. In the wake of the 1991 dissolution of the Soviet Union, the 15 Soviet successor states, faced with severe economic challenges, will become increasingly willing to auction off ex-Soviet military hardware to the highest bidders.[126] Ex-Soviet military equipment, therefore, will remain available, if not become more common, on the black market.

(3) Small arms/light weapons smuggling. Smugglers will continue to transport illicit small arms and light weapons by sea through and beyond 2020. Despite occasional seizures of illegal weapon shipments, the full extent of maritime arms smuggling is unknown; identifying illicit arms shipments will become increasingly difficult as the volume of commercial seaborne trade triples by 2020.

Maritime arms smuggling will remain attractive because it allows smugglers to move large amounts of weaponry among legitimate cargo and within the legitimate transportation infrastructure. In a complex 1989 case, the Colombian police seized 232 Israeli-made Galil assault rifles after conducting a raid on one of the top leaders of the Medellin drug cartel. An investigation revealed the weapons were originally part of a larger arms shipment from Israel to the Caribbean nation of Antigua and Barbuda. The smuggling scheme involved Israelis, Antiguans, Panamanians, and Colombians who attempted to use legitimate covers to divert weapons to the Medellin drug cartel. The operation began in March 1989 when 500 assault rifles and ammunition left Haifa, Israel, aboard the motor vessel ELSE THUESEN bound for Central and South America via Antigua. While in Antigua, the container, presumably filled with weapons, was transferred to the motor vessel SEAPOINT which was supposedly bound for Panama. En route to Panama from Antigua, however, SEAPOINT, diverted to Santa Marta, Colombia, where the Medellin cartel took possession of the weapons.[127]

---

[125] Michael Klare and David Andersen, A Scourge of Guns: The Diffusion of Small Arms and Light Weapons in Latin America (Washington, D.C.: Arms Sales Monitoring Project, Federation of American Scientists), 58.
[126] Jeffrey Boutwell, Michael T. Klare, and Laura W. Reed, eds., Lethal Commerce: The Global Trade in Small Arms and Light Weapons (Cambridge, MA: The American Academy of Arts and Sciences, 1995), 35.
[127] ibid., 62-65.